CONFERENCE ON DISARMAMENT

CD/1129
CD/CW/WP.386
20 February 1992

Original: ENGLISH

AUSTRALIA

AUSTRALIAN NATIONAL SECRETARIAT: SURVEY OF CHEMICAL INDUSTRY

1. Introduction

At the Government-Industry Conference against Chemical Weapons, held in Canberra in September 1989, the Australian Foreign Minister announced that the Department of Foreign Affairs and Trade was proceeding to establish a National Secretariat to act as a nucleus for the future National Authority of the CWC. The Minister stated that the Secretariat, in consultation with appropriate Federal and State Government departments, would be responsible for reviewing existing laws and regulations covering the activities of the Australian chemical industry, and looking for ways to introduce and adapt the prospective requirements of the CWC to the current regulatory matrix.

The first task of the Secretariat was to develop a strategy to prepare Australia for national implementation of a CWC. The strategy comprises a program of consultation and research leading to the development of a package of implementation measures which will be considered by the Australian Government at the appropriate time. A document entitled "Strategy for Preparing for the Implementation of the Chemical Weapons Convention in Australia" was presented to the Conference on Disarmament in February 1991 (CD/1055).

That paper served to illustrate the fact that there is a wide range of tasks which must be initiated ahead of time by any government if it is to be able to commit its country in good faith to the CWC at the time of entry into force.

An important requirement under the future CWC, highlighted in the above mentioned Strategy Paper, is the assembling of data on which chemicals relevant to the CWC are produced, used, and traded. When considering its approach to implementation, Australia's National Secretariat was faced with the problem of not knowing the levels of production or use of the relevant chemicals in Australia. This is a fundamental question which is critical for any country in determining not only the size and shape of its National Authority, but also the overall national implementation effort which will be required.

In common with most other countries, chemicals are heavily regulated in Australia. While this regulation means that various databases on chemical production do exist, it became clear that in themselves, these would not meet all the requirements of the CWC. Because of differences in the way these databases were structured, difficulties were also found in assembling this information in a format suitable for the CWC. Furthermore it was likely, given that these databases are held by different governments within Australia, that there would have been issues of access to resolve. Consequently Australia's National Secretariat concluded it would be necessary to conduct a survey of chemicals which was tailor-made to meet the requirements of the CWC.

2. Survey Design

The survey was designed to the National Secretariat's specifications by the Australian Bureau of Statistics, the government agency responsible for the conduct of the Australian census of population and housing and a large number of industry surveys.

The key objective of the survey was to collect the information about the production, processing and consumption of chemicals that would be required from Australia by the International Organisation when the CWC comes into effect. It was also designed to collect similar information about chemical weapons precursor chemicals subject to Australian export controls.

A first step in the design of the survey was to analyse which organisations would be covered. Analysis of the peaceful purposes for which scheduled chemicals could be used suggested that as well as chemical manufacturers and industrial chemical users, government agencies and laboratories at both Commonwealth and State government levels, universities and hospitals needed to be included.

The main features of the survey methodology were:

. it was a mail survey

. participation was voluntary

. it was directed to companies, not individual plants.

The survey deliberately did not include companies solely engaged in the distribution of, or trade in chemicals. It was considered that this would introduce an element of double-counting between traders and users

and in any case alternative - and possible more reliable - import and export data is potentially available from government sources.

Because it was a mail survey an up-to-date mailing list was required. Such a list was developed on the basis of chemical industry directories supplemented by business telephone directories. Government directories of hospitals and tertiary institutions were used for these organisations. State and territory governments were asked to nominate government organisations at these levels for inclusion on the mailing list. Similarly Commonwealth departments were asked to nominate relevant agencies at this level of government.

This process yielded some 2000 companies and organisations including chemical manufacturers, industrial chemical users, government agencies and laboratories, hospitals and universities to whom the questionnaire was eventually sent.

3. Development of the Survey Questionnaire

In order to ask companies and organisations about the production of chemicals a manageable list of individual chemicals was required.

The chemicals to be covered by the Chemical Weapons Convention are listed in three schedules. Within these schedules some chemicals are listed individually, and others are listed as "families", the families approach having been adopted by our negotiations here in order that all relevant chemicals be covered. Because some of these families may contain a large number of chemicals, however, it was not possible to specify a complete list of chemicals which will be covered by legislation implementing the CWC in Australia.

For the purposes of the survey, the Australian Inventory of Chemical Substances (AICS) was used to identify individual chemicals within the families which are produced in or imported to Australia. The inventory was developed under national occupational health and safety legislation as the basis for distinguishing between existing chemicals and new chemicals for the purposes of assessing a newly introduced chemical's health and safety impact. AICS was used in this survey as an alternative to generating a list of chemicals containing thousands of individual chemicals, most of which would not be relevant to Australia.

A copy of the Survey questionnaire is attached to this paper. It will be noted that for questions relating to families of chemicals, individual chemicals of the family are listed first, followed by a question on other members of the same family. To further assist respondents, a page of the questionnaire provides chemical information on these families.

In addition to scheduled chemicals, the survey covers a list of additional chemicals (Section C, items 18 to 40), which may be used in the production of scheduled chemicals. These additional chemicals are covered by Australian export controls.

The questionnaire was developed by the Australian Bureau of Statistics with the technical assistance of the Materials Research Laboratory, chemical industry organisations and a number of chemical companies.

4. Conduct of the Survey

The survey was conducted in December 1991. Respondents were sent the questionnaire, a covering letter from the

National Secretariat seeking their co-operation and providing a contact name and telephone number for any queries, and a self-addressed, postage-paid envelope. One reminder letter was sent to respondents who did not meet the due date for return of the questionnaire. At an appropriate interval those who fail to respond to the reminder letter will receive a reminder telephone call.

The mail-out was preceded by pre-survey publicity in two chemical industry association newsletters. Two weeks before the questionnaire was sent out, a letter from the head of the Chemical Confederation of Australia requesting co-operation was sent to all addressees on the mailing list.

Data entry and analysis will commence as soon as the last returns have been received. When this is completed Australia will be in a better position to determine its implementation requirements including resource questions in relation to its National Authority. Valuable experience will also have been provided to assist in the design of the compulsory data reporting system which will be introduced under the Australian CWC implementing legislation.

Australia will present a Working Paper incorporating the results of the survey when this is available.

It is hoped that this preliminary communication, in particular the survey methodology and questionnaire, will assist other countries in undertaking similar exercises in preparation for the implementation of the CWC.

DEPARTMENT OF FOREIGN AFFAIRS AND TRADE

Survey of Chemical Industry

November 1991

Confidentiality

Your completed form remains confidential to the Department of Foreign Affairs and Trade.

Due Date

Please complete this form and return it to the address below by
3 December 1991

Help Available

Chemicals marked with a * have a brief technical note on page 26.

If you have any other problems in completing this form or if you require additional copies, please contact Henry Fox on (06) 261 2431 or Sherree Minehan on (06) 261 2338.

Instructions

Please answer all questions carefully, even if you have not handled or produced any of the chemicals listed.

We are interested in your entire Australian operations, so please compile your information accordingly.

Careful estimates should be provided only when actual figures cannot be obtained.

This survey collects information about the **1990** calendar year.

Return Address

The Executive Officer
Chemical Industry Survey - CBS
D-3-N / DND
Department of Foreign Affairs and Trade
Canberra A.C.T. 2600

A. **Were the chemicals described below produced, synthesized, consumed or handled during 1990 in ANY amount:**

Include - amounts imported and exported
- amounts processed without conversion

1 a. O-isopropyl methylphosphonofluoridate
(Sarin, CAS Number 107-44-8)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

b. O-pinacolyl methylphosphonofluoridate
(Soman, CAS Number 96-64-0)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

c. Other O-Alkyl *($\leq C_{10}$, including cycloalkyl)* alkyl *(Me, Et, n-Pr, or i-Pr)*-**phosphonofluoridates *?**

No . . . . . ☐ 1
Yes *(Specify name(s) below)* . . . . . ☐ 2

2 a. O-ethyl N,N-dimethylphosphoramidocyanidate
(Tabun, CAS Number 77-81-6)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

b. Other O-Alkyl *($\leq C_{10}$, including cycloalkyl)* N,N-dialkyl *(Me, Et, n-Pr or i-Pr)* **phosphoramidocyanidates *?**

No . . . . . ☐ 1
Yes *(Specify name(s) below)* . . . . . ☐ 2

3 a. O-ethyl S-2-diisopropylaminoethyl methyl phosphonothiolate
(VX, CAS Number 50782-69-9)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

b. Other O-Alkyl *(H or $\leq C_{10}$, including cycloalkyl)* S-2-dialkyl *(Me, Et, n-Pr or i-Pr)*-aminoethyl alkyl *(Me, Et, n-Pr, or i-Pr)* **phosphonothiolates *** *and corresponding alkylated and protonated salts?*

No . . . . . ☐ 1
Yes *(Specify name(s) below)* . . . . . ☐ 2

4 a. Methylphosphonyldifluoride
(DF, CAS Number 676-99-3)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

b. Other Alkyl *(Me, Et, n-Pr or i-Pr)* **phosphonyldifluorides *?**

No . . . . . ☐ 1
Yes *(Specify name(s) below)* . . . . . ☐ 2

5 a. O-ethyl O-2-diisopropylaminoethyl methylphosphonite
(QL, CAS Number 57856-11-8)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

b. Other O-Alkyl *(H or $\leq C_{10}$, including cycloalkyl)* O-2-dialkyl *(Me, Et, n-Pr or i-Pr)*-aminoethyl alkyl *(Me, Et, n-Pr or i-Pr)* **phosphonites *,** *and corresponding alkylated and protonated salts?*

No . . . . . ☐ 1
Yes *(Specify name(s) below)* . . . . . ☐ 2

6 a. O-isopropyl methylphosphonochloridate
(Chloro Sarin, CAS Number 1445-76-7)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

b. O-pinacolyl methylphosphonochloridate
(Chloro Soman, CAS Number 7040-57-5)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

c. Other O-Alkyl *($\leq C_{10}$, including cycloalkyl)* alkyl *(Me, Et, n-Pr or i-Pr)*-**phosphonochloridates *?**

No . . . . . ☐ 1
Yes *(Specify name(s) below)* . . . . . ☐ 2

Additional chemical names from above - if you need more space please use page 10. *[CAS Number]*

A. Were the chemicals described below produced, synthesized, consumed or handled during 1990 in ANY amount:

Include: - amounts imported and exported
- amounts processed without conversion

7 a. bis (2-chloroethyl) sulphide
(Mustard gas, CAS Number 505-60-2)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

b. 1,2 bis (2-chloroethylthio)-ethane
(Sesquimustard, CAS Number 3563-36-8)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

c. bis (2-chloroethylthioethyl) ether
(O-mustard, CAS Number 63918-89-8)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

d. bis (2-chloroethylthio) methane
(CAS Number 63869-13-6)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

e. 1,3-bis (2-chloroethylthio)-n-propane
(CAS Number 63905-10-2)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

f. 1,4-bis (2-chloroethylthio)-n-butane
(CAS Number not available)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

g. 2-chloroethylchloromethylsulphide
(CAS Number 2625-76-5)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

h. 1,5-bis (2-chloroethylthio)-n-pentane
(CAS Number not available)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

i. bis-(2-chloroethylthiomethyl) ether
(CAS Number not available)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

8 a. 2-chlorovinyldichloroarsine
(Lewisite 1, CAS Number 541-25-3)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

b. bis (2-chlorovinyl) chloroarsine
(Lewisite 2, CAS Number 40334-69-8)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

c. tris (2-chlorovinyl) arsine
(Lewisite 3, CAS Number 40334-70-1)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

9 a. bis (2-chloroethyl) ethylamine
(HN1, CAS Number 538-07-8)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

b. bis (2-chloroethyl) methylamine
(HN2, CAS Number 51-75-2)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

c. tris (2-chloroethyl) amine
(HN3, CAS Number 555-77-1)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

10 3-quinuclidinyl benzilate
(BZ, CAS Number 6581-06-2)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

11 Saxitoxin
(CAS Number 35523-89-8)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

12 Ricin
(CAS Number 9009-86-3)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

13 3,3-Dimethylbutan-2-ol
(Pinacolyl alcohol, CAS Number 464-07-3)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

B. Were the chemicals described below produced, synthesized, consumed or handled during 1990 in amounts which total at least 10 kilograms:

Include - amounts imported and exported
- amounts processed without conversion

1 a. N, N-dimethyl phosphoramidic dichloride
(CAS Number 677-43-0)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

b. Other N, N-Dialkyl *(Me, Et, n-Pr, or i-Pr)* alkyl *(Me, Et, n-Pr, or i-Pr)*-
phosphoramidic dihalides?

No . . . . . ☐ 1
Yes *(Specify name(s) below)* . . . . . ☐ 2

2 a. Diethyl-N, N-dimethylphosphoramidiate
(CAS Number 2404-03-7)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

b. Other Dialkyl *(Me, Et, n-Pr, or i-Pr)* N, N-dialkyl *(Me, Et, n-Pr, or i-Pr)*
phosphoramidates?

No . . . . . ☐ 1
Yes *(Specify name(s) below)* . . . . . ☐ 2

3 Arsenic trichloride
(CAS Number 7784-34-1)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

4 2,2-Diphenyl-2-hydroxyacetic acid
(CAS Number 76-93-7)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

5 Quinuclidin-3-ol
(CAS Number 1619-34-7)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

6 Bis (2-hydroxyethyl) sulphide (thiodiglycol)
(CAS Number 111-48-8)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

7 a. N, N-diethylaminoethyl-2-chloride, hydrochloride
(CAS Number 869-24-9)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

b. Chlorocholine chloride
(CAS Number 999-81-5)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

c. N, N-diisopropyl-2-aminoethyl chloride
(CAS Number 96-70-7)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

d. N, N-diisopropyl-2-aminoethyl chloride hydrochloride
(CAS Number 4261-68-1)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

e. Other N, N-Dialkyl *(Me, Et, n-Pr or i-Pr)*
aminoethyl-2-chlorides
and corresponding alkylated and protonated salts?

No . . . . . ☐ 1
Yes *(Specify name(s) below)* . . . . . ☐ 2

Additional chemical names from above - if you need more space please use page 10.

	[CAS Number]

B. Were the chemicals described below produced, synthesized, consumed or handled during 1990 in amounts which total at least 10 kilograms:

Include - amounts imported and exported
- amounts processed without conversion

8 a. 2-Dimethylaminoethanol
(CAS Number 108-01-0)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

b. 2-Diethylaminoethanol
(CAS Number 100-37-8)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

c. 2-Di-isopropylaminoethanol
(CAS Number 96-80-0)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

d. Choline
(CAS Number 62-49-7)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

e. Choline carbonate
(CAS Number 78-73-9)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

f. Choline chloride
(CAS Number 67-48-1)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

g. Choline hydroxide
(CAS Number 123-41-1)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

h. Choline methyl sulphate
(CAS Number 65151-62-4)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

i. Choline dihydrogen citrate
(CAS Number 77-91-8)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

j. Tricholine citrate
(CAS Number 546-63-4)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

k. Choline bitartrate
(CAS Number 87-67-2)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

l. Other N, N-Dialkyl *(Me, Et, n-Pr, or i-Pr)*
aminoethane-2-ols
and corresponding alkylated and protonated salts?

No . . . . . ☐ 1
Yes *(Specify name(s) below)* . . . . . ☐ 2

9 a. N,N-diisopropyl-2-aminoethane thiol
(CAS Number 5842-07-9)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

b. Dimethylaminoethane-2-thiol hydrochloride
(CAS Number 13242-44-9)?

No . . . . . ☐ 1
Yes . . . . . ☐ 2

c. Other N, N-Dialkyl *(Me, Et, n-Pr, or i-Pr)*
aminoethane-2-thiols
and corresponding alkylated and protonated salts?

No . . . . . ☐ 1
Yes *(Specify name(s) below)* . . . . . ☐ 2

Additional chemical names from above - if you need more space please use page 10. *[CAS Number]*

B. Were the chemicals described below produced, synthesized, consumed or handled during 1990 in amounts which total at least 10 kilograms:

Include amounts imported and exported
amounts processed without conversion

10 a. O-ethyl S-phenyl ethylphosphonothiolothionate
(Fonofos, CAS Number 944-22-9)?

No ☐ 1
Yes ☐ 2

b. Diethyl ethyl phosphonate
(CAS Number 78-38-6)?

No ☐ 1
Yes ☐ 2

c. Methyl phosphonic acid
(CAS Number 993-13-5)?

No ☐ 1
Yes ☐ 2

d. Dimethyl methylphosphonate
(CAS Number 756-79-6)?

No ☐ 1
Yes ☐ 2

e. Diphenyl methylphosphonate
(CAS Number 7526-26-3)?

No ☐ 1
Yes ☐ 2

f. Phosphonic acid, methyl- methyl 3-(trimethoxysilyl)-propyl ester
(CAS Number 67812-17-3)?

No ☐ 1
Yes ☐ 2

g. Phosphonic acid, methyl-, monoammonium salt
(CAS Number 34255-87-3)?

No ☐ 1
Yes ☐ 2

h. Phosphonic acid, methyl-, monoethyl ester
(CAS Number 73750-69-3)?

No ☐ 1
Yes ☐ 2

i. Methyl phosphonyl dichloride
(CAS Number 676-97-1)?

No ☐ 1
Yes ☐ 2

j. Phosphonothioic dichloride, ethyl-
(CAS Number 993-43-1)?

No ☐ 1
Yes ☐ 2

k. Methyl phosphinyl dichloride
(CAS Number 676-83-5)?

No ☐ 1
Yes ☐ 2

l. Phosphonic acid, methyl-, bis(3-trimethoxysilyl) propyl ester
(CAS Number 67812-18-4)?

No ☐ 1
Yes ☐ 2

m. Phosphonic acid, methyl-, compounded with (aminoiminomethyl) urea (1:1)
(CAS Number 84402-58-4)?

No ☐ 1
Yes ☐ 2

n. Phosphonic acid, methyl-, (5-ethyl-2-methyl-1,3,2-dioxaphosphorinan-5-yl) methyl methyl ester, P, oxide)
(Antiblaze 19, CAS Number 41203-81-0)?

No ☐ 1
Yes ☐ 2

o. Phosphonic acid, methyl-, bis[(5-ethyl-2-methyl-1,3,2-dioxaphosphorinan-5-yl) methyl ester, P, P' dioxide)]
(Antiblaze 19, CAS Number 42595-45-9)?

No ☐ 1
Yes ☐ 2

p. 1,2-Oxaphospholan-5-one, 2-methyl-, 2-oxide
(Trevira 271, CAS Number 15171-48-9)?

No ☐ 1
Yes ☐ 2

q. Methyl phosphinyl difluoride
(CAS Number 753-59-3)?

No ☐ 1
Yes ☐ 2

B. Were the chemicals described below produced, synthesized, consumed or handled during 1990 in amounts which total at least 10 kilograms:

Include: - amounts imported and exported
- amounts processed without conversion

10 r. Ethyl phosphinyl dichloride
(CAS Number 1498-40-4)?

No . . . . . ☐1
Yes . . . . . ☐2

s. Ethyl phosphonyl dichloride
(CAS Number 1066-50-8)?

No . . . . . ☐1
Yes . . . . . ☐2

t. Diethyl methylphosphonite
(CAS Number 15715-41-0)?

No . . . . . ☐1
Yes . . . . . ☐2

u. Dimethyl ethylphosphonate
(CAS Number 6163-75-3)?

No . . . . . ☐1
Yes . . . . . ☐2

v. Diethyl methylphosphonate
(CAS Number 1683-08-9)?

No . . . . . ☐1
Yes . . . . . ☐2

w. Ethyl phosphinyl difluoride
(CAS Number 430-78-4)?

No . . . . . ☐1
Yes . . . . . ☐2

x. Other chemicals containing a phosphorus atom to which is bonded an alkyl (Me-, Et-, n-Pr- or i-Pr-) group but no other carbon atoms *?
Exclude - chemicals listed in Q1, Q2 or above

No . . . . . ☐1
Yes *(Specify name(s) below)* . . . . . ☐2

Additional chemical names from above - if you need more space please use page 10. *[CAS Number]*

C. Were the chemicals described below produced, synthesized, consumed or handled during 1990 in amounts which total at least 100 kilograms:

Include: - amounts imported and exported
- amounts processed without conversion

1 Phosgene
(Carbonic dichloride, CAS Number 75-44-5)?

No ☐1
Yes ☐2

2 Cyanogen chloride
(CAS Number 506-77-4)?

No ☐1
Yes ☐2

3 Hydrogen cyanide
(Hydrocyanic acid, CAS Number 74-90-8)?

No ☐1
Yes ☐2

4 Trichloronitromethane
(Chloropicrin, CAS Number 76-06-2)?

No ☐1
Yes ☐2

5 Phosphorus oxychloride
(Phosphoryl chloride, CAS Number 10025-87-3)?

No ☐1
Yes ☐2

6 Phosphorus trichloride
(CAS Number 7719-09-7)?

No ☐1
Yes ☐2

7 Phosphorus pentachloride
(CAS Number 10026-13-8)?

No ☐1
Yes ☐2

8 Trimethyl phosphite
(CAS Number 121-45-9)?

No ☐1
Yes ☐2

9 Triethyl phosphite
(CAS Number 122-52-1)?

No ☐1
Yes ☐2

10 Dimethyl phosphite
(CAS Number 868-85-9)?

No ☐1
Yes ☐2

11 Diethyl phosphite
(CAS Number 762-04-9)?

No ☐1
Yes ☐2

12 Sulphur monochloride
(CAS Number 10025-67-9)?

No ☐1
Yes ☐2

13 Sulphur dichloride
(CAS Number 10545-99-0)?

No ☐1
Yes ☐2

14 Thionyl chloride
(CAS Number 7719-09-7)?

No ☐1
Yes ☐2

15 Triethanolamine
(CAS Number 102-71-6)?

No ☐1
Yes ☐2

16 Ethyldiethanolamine
(CAS Number 139-87-7)?

No ☐1
Yes ☐2

17 Methyldiethanolamine
(CAS Number 105-59-9)?

No ☐1
Yes ☐2

C. Were the chemicals described below produced, synthesized, consumed or handled during 1990 in amounts which total at least 100 kilograms:

Include - amounts imported and exported
- amounts processed without conversion

18 Hydrogen fluoride
(Hydrofluoric acid, CAS Number 7664-39-3)?

No ☐ 1
Yes ☐ 2

19 Ammonium bifluoride
(Ammonium hydrogen fluoride, CAS Number 1341-49-7)?

No ☐ 1
Yes ☐ 2

20 Sodium bifluoride
(Sodium hydrogen fluoride, CAS Number 1333-83-1)?

No ☐ 1
Yes ☐ 2

21 Sodium fluoride
(CAS Number 7681-49-4)?

No ☐ 1
Yes ☐ 2

22 Potassium fluoride
(CAS Number 7789-23-3)?

No ☐ 1
Yes ☐ 2

23 Potassium bifluoride
(Potassium hydrogen fluoride, CAS Number 7789-29-9)?

No ☐ 1
Yes ☐ 2

24 Sodium sulphide
(CAS Number 1313-82-2)?

No ☐ 1
Yes ☐ 2

25 Phosphorus pentasulphide
(CAS Number 1314-80-3)?

No ☐ 1
Yes ☐ 2

26 Sodium cyanide
(CAS Number 143-33-9)?

No ☐ 1
Yes ☐ 2

27 Potassium cyanide
(CAS Number 151-50-8)?

No ☐ 1
Yes ☐ 2

28 2-Chloroethanol
(CAS Number 107-07-3)?

No ☐ 1
Yes ☐ 2

29 3, 3-Dimethyl-2-butanone
(Pinacolone, CAS Number 75-97-8)?

No ☐ 1
Yes ☐ 2

30 Dimethylamine
(CAS Number 124-40-3)?

No ☐ 1
Yes ☐ 2

31 Dimethylamine hydrochloride
(CAS Number 506-59-2)?

No ☐ 1
Yes ☐ 2

32 Diisopropylamine
(CAS Number 108-18-9)?

No ☐ 1
Yes ☐ 2

33 3-Quinuclidone
(CAS Number 3731-38-2)?

No ☐ 1
Yes ☐ 2

34 Phosphorus sulfochloride
(Thiophosphoryl chloride, CAS Number 3982-91-0)?

No ☐ 1
Yes ☐ 2

35 Triethanolamine hydrochloride
(CAS Number 637-39-8)?

No ☐ 1
Yes ☐ 2

36 Oxalyl chloride
(CAS Number 79-37-8)?

No ☐ 1
Yes ☐ 2

C. Were the chemicals described below produced, synthesized, consumed or handled during 1990 in amounts which total at least 100 kilograms:

Include: - amounts imported and exported
- amounts processed without conversion

37 Tert-butylamine
(CAS Number 109-52-9)?

No ☐ 1
Yes ☐ 2

38 Sodium azide
(CAS Number 26628-22-8)?

No ☐ 1
Yes ☐ 2

39 Morpholine
(CAS Number 110-91-8)?

No ☐ 1
Yes ☐ 2

40 Decalin
(CAS Number 91-17-8)?

No ☐ 1
Yes ☐ 2

D. **Were the chemicals described below produced, synthesized, consumed or handled during 1990 in amounts which total at least 1 kilogram:**

Include: - amounts imported and exported
- amounts processed without conversion

1 a. O, O-Diethyl S- (2- (diethylamino) ethyl) phosphorothiolate
(Amiton, CAS Number 78-53-5)?

No ☐ 1
Yes ☐ 2

b. Alkylated and/or protonated salts of O, O-Diethyl S- (2- (diethylamino) ethyl) phosphorothiolate?

No ☐ 1
Yes *(Please specify below)* ☐ 2

Chemical name

[CAS Number]

2 1,1,3,3,3,-pentafluoro-2-(trifluoromethyl)-1-propene
(PFIB, CAS Number 382-21-8)?

No ☐ 1
Yes ☐ 2

E. Did you answer "Yes" to any chemical in Section A?

No *(Go to Section F)* ☐ 1
Yes ☐ 2

How many different chemicals from Section A were handled?

Number

Complete Section I for each such chemical

F. Did you answer "Yes" to any chemical in Section B?

No *(Go to Section G)* ☐ 1
Yes ☐ 2

How many different chemicals from Section B were handled?

Number

Complete Section J for each such chemical

G. Did you answer "Yes" to any chemical in Section C?

No *(Go to section H)* ☐ 1
Yes ☐ 2

How many different chemicals from Section C were handled?

Number

Complete Section K for each such chemical

H. Did you answer "Yes" to any chemical in Section D?

No *(See note at bottom of page)* ☐ 1
Yes ☐ 2

How many different chemicals from Section D were handled?

Number

Complete Section L for each such chemical

If you answered "No" to ALL of Questions E, F, G and H, please turn to the back page.

If you answered "Yes" to ANY of Questions E, F, G, or H, *please turn to page 11.*

Question number	*Additional chemical names*	*[CAS Number]*

I. **If you answered "No" to Question E,** *go to page 13.*
If you answered "Yes" to Question E, *complete the section below for each chemical handled in Section A.*

*NOTE: Please report all quantities to the nearest **0.1 gram**. If a quantity is 'NIL', please write '0'.*
*Report figures for your **1990** operations.*
If you require extra sheets for this section, contact the Department or photocopy this page.

CHEMICAL 1 (from Section A)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
grams	grams	grams
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
grams	grams	grams

CHEMICAL 2 (from Section A)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
grams	grams	grams
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
grams	grams	grams

I. **If you answered "No" to Question E,** *go to page 13.*
If you answered "Yes" to Question E, *continue completing the section below for Section A chemicals.*

*NOTE: Please report all quantities to the nearest **0.1 gram**. If a quantity is 'NIL', please write '0'.*
*Report figures for your **1990** operations.*
If you require extra sheets for this section, contact the Department or photocopy this page.

CHEMICAL 3 (from Section A)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced ____ grams

Quantity processed without conversion ____ grams

Quantity consumed ____ grams

Quantity imported ____ grams

Quantity exported ____ grams

Quantity stored on 31/12/90 ____ grams

CHEMICAL 4 (from Section A)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

Quantity produced ____ grams

Quantity processed without conversion ____ grams

Quantity consumed ____ grams

Quantity imported ____ grams

Quantity exported ____ grams

Quantity stored on 31/12/90 ____ grams

J. **If you answered "No" to Question F,** *go to page 17.*
If you answered "Yes" to Question F, *complete the section below for each chemical handled in Section B.*

NOTE: Please report all quantities to the nearest ***10 kilograms****. If a quantity is 'NIL', please write '0'.*
Report figures for your ***1990*** *operations.*
If you require extra sheets for this section, contact the Department or photocopy this page

CHEMICAL 1 (from Section B)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced ____ kilograms | Quantity processed without conversion ____ kilograms | Quantity consumed ____ kilograms

Quantity imported ____ kilograms | Quantity exported ____ kilograms | Quantity stored on 31/12/90 ____ kilograms

CHEMICAL 2 (from Section B)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

Quantity produced ____ kilograms | Quantity processed without conversion ____ kilograms | Quantity consumed ____ kilograms

Quantity imported ____ kilograms | Quantity exported ____ kilograms | Quantity stored on 31/12/90 ____ kilograms

J. **If you answered "No" to Question F,** *go to page 17.*
If you answered "Yes" to Question F, *continue completing the section below for Section B chemicals.*

*NOTE: Please report all quantities to the nearest **10 kilograms**. If a quantity is 'NIL', please write '0'.*
*Report figures for your **1990** operations.*
If you require extra sheets for this section, contact the Department or photocopy this page.

CHEMICAL 3 (from Section B)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

CHEMICAL 4 (from Section B)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

J. **If you answered "No" to Question F,** *go to page 17.*
If you answered "Yes" to Question F, *continue completing the section below for Section B chemicals.*

NOTE: Please report all quantities to the nearest ***10 kilograms****. If a quantity is 'NIL', please write '0'.*
Report figures for your ***1990*** *operations.*
If you require extra sheets for this section, contact the Department or photocopy this page.

CHEMICAL 5 (from Section B)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced ____ kilograms | Quantity processed without conversion ____ kilograms | Quantity consumed ____ kilograms

Quantity imported ____ kilograms | Quantity exported ____ kilograms | Quantity stored on 31/12/90 ____ kilograms

CHEMICAL 6 (from Section B)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

Quantity produced ____ kilograms | Quantity processed without conversion ____ kilograms | Quantity consumed ____ kilograms

Quantity imported ____ kilograms | Quantity exported ____ kilograms | Quantity stored on 31/12/90 ____ kilograms

J. If you answered "No" to Question F, *go to page 17.*
If you answered "Yes" to Question F, *continue completing the section below for Section B chemicals.*

NOTE: Please report all quantities to the nearest ***10 kilograms****. If a quantity is 'NIL', please write '0'.*
Report figures for your ***1990*** *operations.*
If you require extra sheets for this section, contact the Department or photocopy this page.

CHEMICAL 7 (from Section B)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced ____ kilograms | Quantity processed without conversion ____ kilograms | Quantity consumed ____ kilograms

Quantity imported ____ kilograms | Quantity exported ____ kilograms | Quantity stored on 31/12/90 ____ kilograms

CHEMICAL 8 (from Section B)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

Quantity produced ____ kilograms | Quantity processed without conversion ____ kilograms | Quantity consumed ____ kilograms

Quantity imported ____ kilograms | Quantity exported ____ kilograms | Quantity stored on 31/12/90 ____ kilograms

K. **If you answered "No" to Question G,** *go to page 25.*
If you answered "Yes" to Question G, *complete the section below for each chemical handled in Section C.*

NOTE: Please report all quantities to the nearest ***100 kilograms****. If a quantity is 'NIL', please write '0'.*
Report figures for your ***1990*** *operations.*
If you require extra sheets for this section, contact the Department or photocopy this page.

CHEMICAL 1 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

CHEMICAL 2 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

K. **If you answered "No" to Question G,** *go to page 25.*
If you answered "Yes" to Question G, *continue completing the section below for Section C chemicals.*

NOTE: Please report all quantities to the nearest ***100 kilograms****. If a quantity is 'NIL', please write '0'.*
Report figures for your ***1990*** *operations.*
If you require extra sheets for this section, contact the Department or photocopy this page.

CHEMICAL 3 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

CHEMICAL 4 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

K. **If you answered "No" to Question G,** ***go to page 25.***
If you answered "Yes" to Question G, *continue completing the section below for Section C chemicals.*

NOTE: Please report all quantities to the nearest ***100 kilograms****. If a quantity is 'NIL', please write '0'.*
Report figures for your ***1990*** *operations.*
If you require extra sheets for this section, contact the Department or photocopy this page.

CHEMICAL 5 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

CHEMICAL 6 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

K. **If you answered "No" to Question G,** *go to page 25.*
If you answered "Yes" to Question G, *continue completing the section below for Section C chemicals.*

NOTE: Please report all quantities to the nearest ***100 kilograms****. If a quantity is 'NIL', please write '0'.*
Report figures for your ***1990*** *operations.*
If you require extra sheets for this section, contact the Department or photocopy this page.

CHEMICAL 7 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced ____ kilograms | Quantity processed without conversion ____ kilograms | Quantity consumed ____ kilograms

Quantity imported ____ kilograms | Quantity exported ____ kilograms | Quantity stored on 31/12/90 ____ kilograms

CHEMICAL 8 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

Quantity produced ____ kilograms | Quantity processed without conversion ____ kilograms | Quantity consumed ____ kilograms

Quantity imported ____ kilograms | Quantity exported ____ kilograms | Quantity stored on 31/12/90 ____ kilograms

K. **If you answered "No" to Question G,** *go to page 25.*
If you answered "Yes" to Question G, *continue completing the section below for Section C chemicals.*

NOTE: Please report all quantities to the nearest ***100 kilograms****. If a quantity is 'NIL', please write '0'.*
Report figures for your ***1990*** *operations.*
If you require extra sheets for this section, contact the Department or photocopy this page.

CHEMICAL 9 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

CHEMICAL 10 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

K. **If you answered "No" to Question G,** *go to page 25*
If you answered "Yes" to Question G, *continue completing the section below for Section C chemicals.*

NOTE: Please report all quantities to the nearest ***100 kilograms****. If a quantity is 'NIL', please write '0'.*
Report figures for your ***1990*** *operations.*
If you require extra sheets for this section, contact the Department or photocopy this page.

CHEMICAL 11 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

CHEMICAL 12 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

K. If you answered "No" to Question G, *go to page 25*.
If you answered "Yes" to Question G, *continue completing the section below for Section C chemicals.*

*NOTE: Please report all quantities to the nearest **100 kilograms**. If a quantity is 'NIL', please write '0'.*
*Report figures for your **1990** operations.*
If you require extra sheets for this section, contact the Department or photocopy this page.

CHEMICAL 13 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

CHEMICAL 14 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

K. **If you answered "No" to Question G,** *go to page 25*
If you answered "Yes" to Question G, *continue completing the section below for Section C chemicals.*

NOTE: Please report all quantities to the nearest ***100 kilograms****. If a quantity is 'NIL', please write '0'.*
Report figures for your ***1990*** *operations.*
If you require extra sheets for this section, contact the Department or photocopy ***this page****.*

CHEMICAL 15 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

CHEMICAL 16 (from Section C)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

L. **If you answered "No" to Question H,** ***go to back page.***
If you answered "Yes" to Question H, *complete the section below for each chemical handled in Section D.*

NOTE: Please report all quantities to the nearest ***kilogram****. If a quantity is 'NIL', please write '0'.*
Report figures for your ***1990*** *operations.*
If you require extra sheets for this section, contact the Department or photocopy this page.

CHEMICAL 1 (from Section D)

Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of Facility where chemical handled and/or stored

Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

CHEMICAL 2 (from Section D)

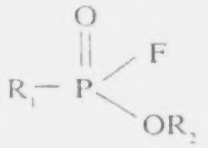
Question number | Common or Trade Name | CAS Number

Chemical Name

Name and Address of facility where chemical handled and/or stored

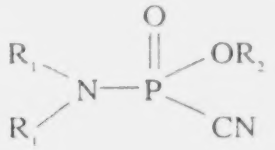
Quantity produced	Quantity processed without conversion	Quantity consumed
kilograms	kilograms	kilograms
Quantity imported	**Quantity exported**	**Quantity stored on 31/12/90**
kilograms	kilograms	kilograms

Question A 1 c: Other O-alkyl alkyl phosphonofluoridates



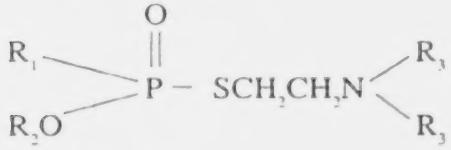
$R_1 = CH_3, C_2H_5, C_3H_8$
$R_2 = C_nH_{2n+1}$, n = 1 to 10

Question A 2 b: Other O-alkyl N,N-dialkyl phosphoramidocyanidates



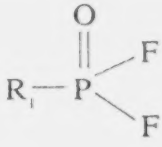
$R_1 = CH_3, C_2H_5, C_3H_8$
$R_2 = C_nH_{2n+1}$, n = 1 to 10

Question A 3 b: Other O-alkyl S-2-dialkyl aminoethyl alkyl phosphonothiolates



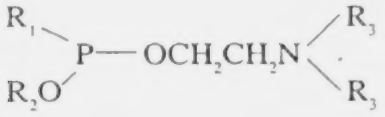
$R_1 = CH_3, C_2H_5, C_3H_8$
$R_2 = C_nH_{2n+1}$, n = 0 to 10
$R_3 = CH_3, C_2H_5, C_3H_8$

Question A 4 b: Other alkyl phosphonyldifluorides



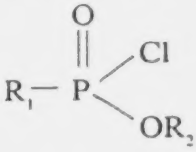
$R_1 = CH_3, C_2H_5, C_3H_8$

Question A 5 b: Other O-alkyl O-2-dialkyl aminoethyl alkyl phosphonites



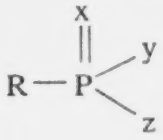
$R_1 = CH_3, C_2H_5, C_3H_8$
$R_2 = C_nH_{2n+1}$, n = 0 to 10
$R_3 = CH_3, C_2H_5, C_3H_8$

Question A 6 c: Other O-alkyl alkyl phosphonochloridates

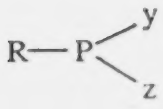


$R_1 = CH_3, C_2H_5, C_3H_8$
$R_2 = C_nH_{2n+1}$, n = 1 to 10

Question B 10 x: Other chemicals containing a phosphorus atom to which is bonded an alkyl group but no other carbon atoms



or



x, y and z may be any functional group or heteratom, provided that no other carbon atoms are directly bonded to this phosphorus.

All of the chemicals in Question B 10 are examples of the structure described.

M **Did you answer yes to any of the chemicals or chemical groups listed inside the form?**

No *(Go to Question P)* . . . . . ☐ 1

Yes . . . . . ☐ 2

N **Did you need any extra sheets for Sections I, J, K or L?**

No *(Go to Question P)* . . . . . ☐ 1

Yes . . . . . ☐ 2

O **How many extra sheets did you need?**

Number ☐

P **What is the name of the organization** *(company, facility, laboratory, etc.)* **covered by this questionnnaire?**

Name

Mailing Address

Q **If we have any queries about this form, who should we contact?**

Name and title

Address

Telephone Number

R **Do you have any comments about this collection?**

S **Please return this form by 3 December to:**

The Executive Officer
Chemical Industry Survey - CBS
D-3-N/DND
Department of Foreign Affairs and Trade
Parkes A.C.T. 2600

THANK YOU FOR YOUR CO-OPERATION